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UNITED STATES PATENT APPLICATION

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FOR

GARMENT WITH VENTILATING MEANS

TITLE OF THE INVENTION

Garment With Ventilating Means

FIELD OF THE INVENTION

The invention relates to a garment with ventilating means, a zip fastener suitable for it and a garment module suitable for it.

The term garment is intended in the present case to comprise all body-covering articles, in particular also footwear, gloves and head coverings.

BACKGROUND OF THE INVENTION

There are garments, for example for motorcyclists, which have a high wind resistance and are preferably also waterproof, and have correspondingly low air permeability with correspondingly low ventilation of the inside of the garment, which may be unpleasant on warm days.

US 5 845 336 A and US 6 236 510 B1 disclose jackets for motorcyclists which are provided with a ventilating means which is formed by a ventilation opening which can be closed to a greater or lesser extent by means of a zip fastener, through which opening ventilating air can reach the inside of the jacket. To prevent the ventilation opening from gaping open too wide and foreign bodies such as small stones and insects from getting in, the ventilation opening is backed by a net-like material, which in the case of both known jackets runs on the inner side of the zip fastener parallel to the zip fastener and consequently forms an unopenable second fastener level running parallel to the zip fastener level. In the case of US 5 845 336 A, side borders of the net material are securely sewn to textile layers of the jacket, also sewn onto which are textile strips to which the side stringers of the zip fastener bearing the rows of closing links of the zip fastener are fastened. In the case of US 6 236 510 B1, the two lateral ends of the net material are joined to one of the two side stringers each of the zip fastener. In both cases, the width of the net material is made wide enough to allow the opening of the jacket, which can be closed by the zip fastener, to be opened sufficiently wide for ventilation.

Depending on whether or not the user of the motorcycle jacket needs ventilation, the zip fastener is kept open or closed. In the open state, ventilating air can pass through the net material arranged behind the zip fastener to the inside of the motorcycle jacket.

To protect the ventilation openings from water ingress, in the case of both known jackets they are provided with covering strips, also known as flaps, which can be fixed by means of hook-and-loop (Velcro®) fasteners in a closed state, in which they cover the zip fastener of the ventilation opening, and in an open state, in which they expose the zip fastener of the ventilation opening.

Since the two sides of the zip fastener are held together by the net material even when the zip fastener is open, that is to say it is not possible for the jacket opening which can be closed by the zip fastener to be opened completely freely, in the case of these known solutions the ventilating means cannot be provided in the region of the front opening of the jacket which has to be opened for putting the jacket on and taking it off. The ventilating means known from the two cited documents is therefore suitable only for secondary openings of the jacket, for example in the region of the breast pocket or in the shoulder region. Therefore, with a ventilating means of this type, it is also only possible to realize a relatively small ventilation opening with a correspondingly limited ventilating effect.

If a need for ventilation arises while a motorcycle is being ridden, because it becomes too hot, or if the ventilating means is to be closed while the motorcycle is being ridden, for example because it begins to rain, the zip fastener has to be opened or closed while riding, and this has to be carried out with a hand which is in quite a thick motorcycle glove. Operating the zip fastener while riding is therefore awkward, takes a correspondingly long time and, because of the correspondingly prolonged distraction, and steering of the motorcycle with only one hand, entails a corresponding risk potential.

In order to protect the motorcyclist from rain and/or spray water and to ensure breathability of the motorcycle jacket, the motorcycle jacket according to US 5 845 336 A is equipped with a waterproof, water-vapor-permeable functional layer.

It is known from EP 0 405 062 B1 to provide the front zip fastener of jacket- or coat-like garments which are equipped with a waterproof and water-vapor-permeable functional layer with a covering strip lying over the zip fastener and an intermediate strip arranged between the zip fastener and the covering strip, which strips are each of a waterproof design in order to prevent water from penetrating to the front zip fastener.

The company BMW of Munich, Germany, supplies a motorcyclist jacket, under the name "BMW Canyon", which has in the front region an inner zip fastener for opening and closing the jacket and an outer zip fastener for

closing two covering strip parts. The inner zip fastener is joined to two leather front parts of the jacket. The two covering strip parts each comprise an outer layer of closed leather and an inner layer which is provided with ventilating holes and which is loosely joined to the outer layer. Side borders of the covering strips at the far side of the outer zip fastener are joined to the outer material, or shell, of the jacket by means of an air-permeable seam in such a way that, when the covering strips are open, air which has reached the space between the inner layer and the outer layer can reach the inside of the jacket by passing through the ventilating holes. In the case of this jacket, too, a zip fastener has to be opened or closed for adjustment between ventilation and non-ventilation, which, as already mentioned, is problematical with a gloved hand. What is more, there is the problem that, with covering strips opened for ventilation, the inner layers provided with the ventilation openings are pressed by the wind pressure, which occurs at a relatively high travelling speed, against the outer layers of the covering strips in such a way that the ventilation no longer works.

The object of the invention is to provide a garment with a ventilating means which is certain to allow ventilation of the inside of the garment over a large surface area and, in the case of a jacket- or coat-like garment, which permits ventilation also in the region of the front fastening without having to open a front zip fastener. A further object is to eliminate the need to operate a zip slide fastener in order to activate the ventilating means, since this can only be carried out with difficulty with clumsy gloves, as in the case of a motorcyclist who would like to bring the ventilating means of a motorcyclist jacket into the ventilating state while riding the motorcycle.

This object is achieved by a garment as claimed in patent claim 1, with a zip fastener as claimed in patent claim 38 and a garment module as claimed in patent claim 42. Embodiments of the invention are specified in the dependent patent claims.

In the case of a garment according to the invention, the ventilating material is not arranged in front of or behind the main fastening device, parallel to the latter, as in the case of the two US patents cited above, but as a lateral continuation of it, that is to say laterally adjoining the main fastening device. This has the effect that the ventilating means according to the invention on the one hand does not represent a hindrance to opening the main fastening device as far as desired, and on the other hand ventilation is possible even with the main fastening device closed. Therefore, the ventilating means according to the invention can also be arranged in the region of the fastening on the front

side of a jacket- or coat-like garment. This is so because, unlike the two known ventilating means, the ventilating means according to the invention does not limit the opening width of the main fastening device, consequently also does not hinder opening of a front zip fastener, as is also inadmissible for putting on or taking off a jacket- or coat-like garment. Ventilation via the ventilating means according to the invention also does not require partial or complete opening of the main fastening device.

A significantly greater ventilating effect can be achieved via a front fastening of a garment, for example a jacket-like garment, than via the pocket-like ventilating openings of the jackets according to the US patents cited above.

According to the invention, ventilating air can flow freely through the ventilating material being arranged in the ventilating position. It is not backed by an air-impermeable layer, as in the case of the cited BMW jacket and therefore effective ventilation is possible, unhindered even in the case of high travelling speeds and corresponding air pressure.

The ventilating material of a ventilating means according to the invention may be arranged on both sides of the main fastening device or only on one side of the main fastening device. This also applies if the ventilating material is integrated into a zip fastener, in that at least one of the two side stringers or both side stringers of the zip fastener are of a ventilatable design, in that they are made up of ventilating material.

The invention provides a garment with a main fastening device and a supplementary fastening device, wherein the main fastening device detachably joins opposing edges of two garment pieces made up of garment material and has two main fastening sides which can be joined to each other in a detachable way and which sides are each joined to one of the two garment edges, wherein at least one of the two main fastening sides is joined to the respective garment edge by means of a ventilating material forming a ventilating means, by means of which the inner side of the garment is accessible to ventilating air even when the main fastening device is closed, and wherein the supplementary fastening device is designed as a covering strip, which is movable, in relation to the main fastening device, between a closed position, in which it covers at least the ventilating material, and an open position, in which it exposes at least a part of the ventilating material.

Therefore, the main fastening device does not first have to be opened in order to put the ventilating means into a ventilatable state. For the most probable case, in which the main fastening device is a zip fastener, the latter

consequently need not be operated in order to make the ventilating means effective, which is difficult in particular with thick motorcyclist gloves.

In the case of using a zip fastener as the main fastening device, according to a first aspect of the invention, a conventional zip fastener may be used, with preferably textile side stringers, which are each joined on their longitudinal sides that are not joined to the closing links to a first longitudinal side of a strip of ventilating material, the second longitudinal side of which is joined to the outer material of the garment. In this case, it is preferable to use zip fasteners with side stringers of the same color as the strips of ventilating material.

This problem of color matching does not exist if, according to a second aspect of the invention, a zip fastener of which the side stringers themselves are made up of ventilating material is used. In the case of a zip fastener of this type, the side stringers are preferably wider than in the case of a conventional zip fastener, in order to make a greater ventilating surface area available than if the ventilating side stringers of the zip fastener were no wider than the side stringers of conventional zip fasteners. By the use of a zip fastener of this type, according to the invention, on the one hand the problem of color matching is avoided and, on the other hand, the work involved in producing the garment is reduced, because two seams are eliminated, that is to say those seams which, in the case of a conventional zip fastener, would have to be produced between the side stringers of the latter and the two strips of ventilating material.

In one embodiment of the invention the side stringers of the zip fastener have a differing material density in the transverse direction. In the region of the side stringer edges on which the row of closing links of the zip fastener is fastened, the material density is higher, to allow the closing link elements to be securely fastened to the side stringers, while the material density in the remaining region of the side stringers is lower and has a higher porosity, to achieve a higher ventilating effectiveness. There is also the possibility of making the material density higher at both of the side stringer edges and of providing only the middle region located between them with a lower material density, to allow the side stringers to be sewn more securely to the outer material of the garment.

Making the side stringers of the zip fastener themselves of ventilating material or joining the side stringers of a conventional zip fastener to separate strips of ventilating material are not mutually exclusive alternatives. There may also be cases in which it is advantageous to combine a zip fastener

according to the invention with ventilatable side stringers with separate strips of ventilating material, for example to create special color effects, in that different colors are chosen for the side stringers of the zip fastener and the separate strips of ventilating material.

According to a third aspect of the invention, the ventilating means according to the invention may be combined with the main fastening device and the covering strip forming the supplementary fastening device to form a garment module and supplied as a module to the manufacturer of the garment.

The ventilating means according to the invention is suitable not only for main fastening devices in the form of zip fasteners but also for other main fastening devices, for example in the form of hook-and-loop fasteners and magnetic fasteners.

The fastening device of a garment according to the invention, provided with ventilating means, may be, for example, a front fastener of a jacket- or coat-like garment, but also other fasteners, for example for releasably closing a reach-through to an inner side of the garment or for releasably closing a pocket opening of the garment. The main fastening device may, however, also be a device for detachably joining two garment pieces which can be placed against each other, for example leg parts of pants or sleeve parts, with which short pants can be turned into long pants or a short sleeve can be turned into a long sleeve, or seam sections of pants or sleeves held together by means of an openable fastening device.

A ventilating means according to the invention is suitable not only for motorcyclist clothing but also as a garment for cyclists or skiers or for protective work clothing.

It is particularly advantageous for motorcyclist clothing, because, for safety reasons and in order to offer adequate protection from the wind at high travelling speeds, motorcyclist clothing is substantially air-impermeable, with the result that on hot days and at slow travelling speeds in particular there is a need for supplying cooling air to the inside of the garment.

In particular in the case of use as motorcyclist clothing, the waterproofness of the garment is also an important aspect. Therefore, motorcyclist clothing is nowadays made waterproof, in that either a waterproof outer material is used or a waterproof functional layer, which is preferably also water-vapor-permeable in order to maintain the breathability of the garment, making it possible for moisture from perspiration to be dissipated to the outer side of the garment, is arranged on the inner side of a waterproof and air-permeable outer material.

Arranging a ventilating means in the region of the front fastener of a garment is accompanied by a further advantage in the case of garments which are provided with such a functional layer. If the ventilating means is arranged in a pocket-like manner away from the front fastener of a garment, for example in the chest or shoulder region, as in the case of the jackets according to the US patents cited above, the functional layer must be breached at this point, because otherwise the airtight functional layer would act as a ventilation barrier. This requires great expenditure, since the functional layer has to be sealed in the region of the ventilation opening, in particular in the region of the seams around the ventilating means required in conjunction with the ventilating means. By contrast, the present invention makes it possible for the ventilating means to be arranged in the region of the front fastening of a jacket-like garment, that is to say in a region in which the functional layer has to be interrupted in any case.

In order to prevent ventilation at those times when ventilation through the ventilating means according to the invention is not needed or desired, for example in the case of cool temperatures or strong wind, the covering strip is provided, which in a closed state covers the ventilating means and, in the event that ventilation is desired, can be brought into an open state, in which it exposes the ventilating means. In the case of a waterproof garment, the covering strip is preferably likewise of a waterproof design, in order, in its closed state, to prevent the penetration both of cooling air and of water to the inside of the garment. In the case of a garment with a waterproof and water-vapor-permeable functional layer, the covering strip is also preferably equipped with a water- and air-permeable outer material and is provided with a waterproof and water-vapor-permeable functional layer, in order not to block the breathability of the garment in the region of the covering strip.

Particularly good protection against the penetration of water to the ventilating means is achieved if, according to one embodiment of the invention, an intermediate strip which, in a closed state, covers the ventilating means is also arranged between the main fastening device and the covering strip, the covering strip and the intermediate strip preferably being fastened to the outer material on different sides of the main fastening device and, in a preferred way, the free end of the intermediate strip being folded over on itself toward its outer side, in order to create a collecting labyrinth arrangement for water and wind. These measures are particularly advantageous in the case of motorcyclist clothing, in order to prevent water being pushed in as far as the ventilating means by the airstream caused during driving.

To keep the covering strip and, if there is one, also the intermediate strip in its closed position, the covering strip and the outer material of the garment, or, if an intermediate strip is used, the covering strip and the intermediate strip, are provided with detachable, complementary fastening elements, by means of which the covering strip can be kept in the closed state. It is particularly preferred to provide the covering strip and, if there is one, also the intermediate strip with detachable fixing elements, by means of which they can be detachably fixed in their open state, in order that, when there is a need for ventilation, the ventilating means is not blocked by unintentional closing of the covering strip and, if there is one, the intermediate strip.

The covering strip and, if there is one, also the intermediate strip may each be fixed to a longitudinal end of the main fastening device and folded from there over the main fastening device or unfolded away from it. In most cases, it will be preferable to fasten the covering strip and, if there is one, also the intermediate strip next to longitudinal sides of the main fastening device, with the result that they can be folded from the respective longitudinal side of the main fastening device over the main fastening device and the ventilating means and unfolded again away from the latter.

In the event of using a waterproof and preferably also water-vapor-permeable functional layer, special waterproofing measures are taken for waterproofing and preventing the ingress of water through seams by means of which the individual components of the covering strip or the intermediate strip are fastened to one another and the covering strip or the intermediate strip are fastened to the outer material of the garment. For this purpose, such seams may, for example, be made waterproof by a seam sealing tape or by being designed as waterproof adhesive seams.

In one embodiment of the invention, the ventilating means is provided with additional components, for example a pocket, a main fastening device and/or a light-reflecting means, which is arranged in or on the ventilating material.

In the case of a garment which is provided with a ventilating means according to the invention and a covering strip and, if appropriate, has an intermediate strip, for opening or closing the ventilating means, the user of the garment, for example a motorcyclist, need only fold over the covering strip and, if there is one, also the intermediate strip, from the open state into the closed state, or vice versa, to adjust to ventilation or non-ventilation. This is possible in an extremely short time and entirely unproblematical even with a hand which is in a thick glove, with the result that such an action can also be

carried out without any problem while riding the motorcycle. This is the case particularly whenever the fastening elements which keep the covering strip and, if there is one, also the intermediate strip in their closed state or in their open state are magnetic elements, with the result that the opening and closing of the ventilating means can be carried out by corresponding moving of the covering strip and, if there is one, the intermediate strip by means of a simple wiping movement with the motorcyclist's gloved hand.

In one embodiment of the invention, the ventilating means has in addition to the ventilating material a ventilation restricting means, by means of which it is possible in addition to the two possibilities of no ventilation and maximum ventilation to choose a ventilating stage in between with restricted ventilation. In a restricting position, the ventilation restricting means is arranged parallel to the ventilating material, and at least partially covers the latter, and reduces the amount of ventilating air reaching the inside of the jacket. In a release position, the ventilation restricting means exposes the ventilating material and does not effect any ventilation restriction. In one embodiment, the ventilation restricting means is formed by the covering strip and/or the intermediate strip being subdivided into at least two strip parts, which can be moved independently of each other into an open position or a closed position. In this case, the ventilating performance depends on how many of the strip parts are in the open position. In another embodiment, the ventilation restricting means is formed by arranging between the ventilating material and the covering strip or - if there is one - the intermediate strip a restricting strip, which can be moved in relation to the ventilating material between a closed position, in which it covers at least part of the ventilating material, and an open position, in which it exposes the ventilating material, the restricting strip being made up of a ventilation restricting means which has an air permeability value which is lower than the air permeability value of the ventilating material. It is also possible to combine both variations of the ventilation restricting means with each other. In this case, further graduations of restricted ventilation are obtained.

Suitable materials for the waterproof, water-vapor-permeable functional layer are, in particular, polyurethane, polypropylene and polyester, including polyether esters and their laminates, such as are described in the documents US-A-4,725,418 and US-A-4,493,870. Particularly preferred, however, are expanded microporous polytetrafluoroethylene (ePTFE), as described for example in the documents US-A-3,953,566 and US-A-4,187,390, and expanded polytetrafluoroethylene which is provided with hydrophilic

impregnating agents and/or hydrophilic layers; see, for example, the document US A 4,194,041. A microporous functional layer is a functional layer of which the average pore size lies between approximately 0.2 μm and approximately 0.3 μm.

The pore size can be measured with the Coulter Porometer (trade name), which is produced by Coulter Electronics, Inc., Hialeath, Florida, USA.

A fabric, such as for example a functional layer or water-repellent outer material, possibly including waterproof seams, is regarded as "waterproof" if it withstands a water ingress pressure of at least 1×10^4Pa. The material of the functional layer preferably withstands a water ingress pressure of over 1×10^5 Pa. The water ingress pressure is measured by a test method in which distilled water at 20±2°C is supplied with increasing pressure to a 100cm² sample of the functional layer. The pressure increase of the water is 60±3 cm of water column per minute. The water ingress pressure then corresponds to the pressure at which water appears for the first time on the other side of the sample. Details of the procedure are described in ISO standard 0811 from the year 1981.

A fabric, such as for example a functional layer, is regarded as "water-vapor-permeable" if it has a water-vapor permeability coefficient Ret of less than 150 $m^2\times Pa\times W^{-1}$. The water-vapor permeability is tested by the Hohenstein skin model. This test method is described in DIN EN 31092 (02/94) or ISO 11092 (1993).

The air permeability of fabrics is determined in accordance with the European standard EN ISO 9237 (1955) and specified in $l/m^2/s$. The ventilating material of the ventilating means according to the invention has an air permeability value of at least approximately 30 to 40 $l/m^2/s$. In practical embodiments of the invention, the ventilating material has a significantly higher air permeability value in the range from 100 $l/m^2/s$ to 1000 $l/m^2/s$ or above. The air permeability value of the ventilation restricting material is at least around 30 to 40 $l/m^2/s$, but may also be considerably higher, for example in the range from approximately 100 $l/m^2/s$ to 400 $l/m^2/s$ or above.

Ventilatable material is to be understood in connection with the present invention as meaning material which has a higher air permeability value than in the case of garments made of commonly used materials without ventilating means according to the invention. The following are to be regarded as examples of this.

1. Water-repellent zip fastener TIZIP from the company TITEX:
    - air permeability value < 5.0 l/m^2/s
    - there is virtually no air permeability.

2. Normal zip fastener together with a waterproof double covering strip corresponding to figure 1 of EP 0 581 186 B1, with a two-layer laminate, made up of an ePTFE functional layer and a woven textile, between the zip fastener side stringers and the covering strip:
    - air permeability value < 15.0 l/m^2/s
    - it is a front construction of a garment which has scarcely any air permeability.

3. Normal zip fastener with closed waterproof double covering strip over the zip fastener, having a covering strip to the right and left of the zip fastener, which are both made up of a two-layer laminate with an ePTFE layer (as in case 2):
    - air permeability value 2.3 l/m^2/s
    - there is virtually no air permeability.

4. Ventilating material Cordura AFT from the company Rökuna, knitted nylon fabric 6.6:
    - air permeability value > 765.0 l/m^2/s
    - very high air permeability.

5. Restricting strip material Cordura linen weave fabric with 300 dtex Seafield:
    - air permeability value 41.2 l/m^2/s
    - air permeability low in comparison with the ventilating material under 4., but still perceptible.

6. Ventilating construction according to the invention, corresponding to figure 3, with covering strip 31 and intermediate strip 49, each in the open position:
    - air permeability value 543.0 l/m^2/s
    - on account of the use of a conventional zip fastener, lower air permeability than that of the ventilating material used according to 4., but still comparatively high air permeability.

7. Ventilating construction according to the invention corresponding to figure 2, with covering strip 31 and intermediate strip 49, each in the closed position:
    - o air permeability value 3.4 $l/m^2/s$
    - o there is virtually no air permeability.

The invention is now explained in more detail in the embodiments shown below. In the drawings:

Figure 1 shows an embodiment of a garment according to the invention;

Figure 2 shows a schematized sectional view, not to scale, of a fastening and ventilating region in the closed state, along sectional line II-II in figure 1;

Figures 2a-2c show various types of fastening elements for the structure shown in figure 2;

Figure 3 shows in a schematized sectional representation, not to scale, the fastening and ventilating part of the garment shown in figure 2, along sectional line III-III in figure 1;

Figure 4a shows a conventional zip fastener in combination with ventilating material according to the invention;

Figure 4b shows a zip fastener which is constructed according to the invention with ventilating material;

Figure 5 shows a detail of the structure shown in figure 2 for a garment which has an outer material and a functional layer loosely attached to the outer material;

Figure 6 shows a detail of the structure shown in figure 2, in which an outer material and a functional layer are joined to each other to form a laminate;

Figure 7 shows a detail of the structure of figure 2, in which the garment has an outer material and a functional lining separate from the latter;

Figure 8 shows a sectional view similar to that in figure 2, but for an embodiment of the invention in which a covering strip and an intermediate strip are located on the inner side of the zip fastener, facing the inside of the jacket;

Figure 9 shows a sectional view similar to that in figure 2, but for an embodiment of the invention with a ventilation restricting means in the form of a restricting strip; and

Figure 10 shows a garment similar to that in figure 1, but with a ventilation restricting means in the form of a covering strip with two covering strip parts, which can each be brought independently of each other into a closed or open position and, in the closed position, each cover only a partial region of the ventilating material.

The garment shown as an example in figure 1 is a jacket 11 with a front fastening with a main fastening device in the form of a zip fastener 13 and a supplementary fastening device in the form of a covering strip 31. As can be seen better in figure 4a, the zip fastener 13 comprises two textile side stringers 15 and 17, on each of the mutually facing longitudinal side edges of which closing links are fastened, with a row of closing elements 19 in the form of teeth, spirals, clasps or grooves. By displacing a slide 21, only shown in figure 1, the closing links can be hooked into one another for closing and unhooked from one another for opening.

The side stringers 15 and 17 of the zip fastener 13 are not directly fastened to the edges of the two parts of the jacket 23 and 25 that are to be closed by the zip fastener 13, but are fastened in each case with a ventilating strip 27 or 29, which each consist of a ventilating material, respectively interposed. The ventilating material is preferably textile material, to be precise woven, knitted, felt, mesh or net material made such as to have a relatively high air permeability, with an air permeability value of at least approximately 30 to 40 $l/m^2/s$, which in practical embodiments may even be much higher, for example in the range from approximately 100 $l/m^2/s$ to 1000 $l/m^2/s$ or even above that. In one embodiment of the invention, a textile fabric with a knitted gauze structure which is available under the trade name Cordura®AFT from the company Rökana and has an air permeability value of over 765 $l/m^2/s$ is used as the ventilating material.

Figure 4b shows an embodiment of the invention in which the side stringers 15a and 17a of the zip fastener 13 themselves consist of ventilating material, the side stringers 15a and 17a preferably having a greater width than the side stringers 15 and 17 of conventional zip fasteners in order to make adequate ventilating surface areas available. The aforementioned material Cordura® AFT is also suitable for the side stringers 15a and 17a of this zip fastener 13.

As shown in the lower part of figure 1 in the region of a sectional line II-II, the zip fastener 13 and the ventilating strips 27 and 29 can be covered by means of the covering strip 31 if the ventilation via the ventilating strips 27 and 29 is not desired.

Figure 2 shows in a schematic way, not to scale, a cross-sectional view of a detail of the front part of the jacket 11 along the sectional line II-II shown in figure 1. The zip fastener 13 with its side stringers 15 and 17 can be seen, and so can the closing elements 19 arranged on them in the form in which they are hooked into one another, and on both sides of the side stringers 15 and 17 the ventilating strips 27 and 29 of the ventilating means. In this case, the side stringers 15, 17 of the zip fastener 13 and the ventilating strips 27 and 29 of the ventilating means are sewn to one another by means of a double seam 33 and 35 respectively, in each case at their respectively neighboring longitudinal side edges. The longitudinal side edges of the ventilating strips 27 and 29 that are remote from the zip fastener 13 are fastened to a garment edge 41 on the left and a garment edge 43 on the right in figure 2, by means of the seams 37 and 39, respectively.

To dispense with the need for a further figure, figure 2 shows different embodiments on the right-hand side and the left-hand side with regard to the layers of material used. However, this is not intended to suggest that jackets which have a different structure on either side of the zip fastener 13 are produced. The right-hand side of figure 2 shows an embodiment with what is known as an LTD-liner construction, LTD standing for liner-to-drop. This is a construction for a waterproof, water-vapor-permeable garment in which an outer material 45 and a functional lining 47 separate from the latter are used. The functional lining 47 comprises a laminate which has a waterproof, water-vapor-permeable functional layer and a lining layer. The outer material 45 may have, but does not have to have, a functional layer.

It is advantageous in the case of the LTD-liner construction that it is possible to dispense with an extra lining, which leads to a lighter jacket structure, and there is greater freedom with regard to the design on the side of

the outer material than when a laminate having both the outer material and the functional layer is used. With use of the separate outer material 45 in the case of the LTD-liner construction, pockets can be sewn onto the outer material and embroidery applied, irrespective of the conditions which would have to be met for the functional layer or would adversely affect the function of the functional layer. While all the seams for pockets and embroidery would have to be sealed with seam sealing tape if a laminate comprising the outer material and the functional layer were used, there is no need for this in the case of the LTD-liner construction, since the functional lining 47 is not affected by such seams.

The left-hand side of figure 2 does not show an LTD-liner construction but a construction with a laminate 46 which has an outer material layer and a functional layer, and with a lining 48 which does not have a functional layer.

In the embodiment shown in figure 2, provided in the region of the zip fastener 13 and the ventilating strips 27 and 29 are the already mentioned covering strip 31 and, furthermore, between the covering strip 31 and the zip fastener 13, an intermediate strip 49. In this embodiment, the covering strip 31 and the intermediate strip 49 are on the outer side of the zip fastener, as seen from the body of the user of the jacket. The two strips 31 and 49 may, however, also be arranged on the inner side of the zip fastener 13, as will be explained in more detail later, on the basis of figure 8.

In the embodiment of figure 2, the covering strip 31 has a fixed covering strip side 51, seen on the right of the zip fastener 13 and of the right-hand ventilating strip 29 in figure 2, and a free covering strip side 53, seen on the left of the zip fastener in figure 2. The intermediate strip 49 has a fixed intermediate strip side 55, seen on the left of the zip fastener 13 and of the left-hand ventilating strip 27 in figure 2, and a free intermediate strip side 57, which would lie to the right of the zip fastener 13 if the intermediate strip 49 were stretched out, but is located above the zip fastener 13 since its free end has been folded back in the upward direction. This produces a folded-over channel 39, which catches water which gets between the covering strip 31 and the intermediate strip 49.

The covering strip 31 has a covering strip outer part 61, lying on the outside as seen from the zip fastener 13, and a covering strip inner part 63, located on the inner side of said outer part. The intermediate strip 49 has on its outer side an intermediate strip outer part 65 and on its inner side an intermediate strip inner part 67. The covering strip outer part 61 and the intermediate strip outer part 65 consist of the outer material 45 of the jacket 11, while the covering strip inner part 63 and the intermediate strip inner part 67

consist of the material of the functional lining 47 or some other material having a functional layer. The covering strip outer part 61 and the covering strip inner part 63 are joined to each other on the free covering strip side 53 by means of a double seam 69. The intermediate strip outer part 65 and the intermediate strip inner part 67 are fastened to each other on the free intermediate strip side 57 by means of a double seam 71.

The sides on the right in figure 2 of the covering strip outer part 61 and covering strip inner part 63 are fastened to the corresponding edge of the outer material 45 and of the functional lining 47 by means of a double seam 73 and by means of a double seam 75, respectively. The ends on the left in figure 2 of the intermediate strip outer part 65 and of the intermediate strip inner part 67 are fastened to the corresponding edge of the outer material/functional layer laminate 46 and of the lining 48 by means of a double seam 77 and a single seam 79, respectively.

In the region of the fixed covering strip side 51, a strip intermediate part 81 is arranged on the inner side of the covering strip outer part 61 , the right-hand side of which in figure 2 is joined in a waterproof manner to the covering strip outer part 61 and to the corresponding edge of the outer material 45 by means of the double seam 73 and, in the vicinity of its left-hand side in figure 2, to the covering strip inner part 63 by means of an adhesive seam 83. The strip intermediate part 81 has a waterproof functional layer on the covering strip side. Water which has penetrated through the material of the covering strip outer part 61 on the left-hand side of the adhesive seam 83 in figure 2 therefore cannot reach the right-hand side of the adhesive seam 83, and consequently the seams 39, 73 and 75. The double seam 75 is sealed in a waterproof manner on the outer side of the covering strip inner part 63 and of the functional lining 47 by means of a seam sealing band 85, with the result that water which has penetrated the double seam 73 and/or the outer material 45 located to the right of it cannot reach the seams 39 and 75, and consequently get as far as the inside of the jacket 11.

The intermediate strip outer part 65 is provided in the region of the fixed intermediate strip side 55 on its inner side with a strip intermediate part 87 on the intermediate strip side, which is joined in a waterproof manner on its left-hand side in figure 2 both to the intermediate strip outer part 65 and to the corresponding edge of the outer material/functional layer laminate 65 by means of the double seam 77 and in the vicinity of its right-hand side in figure 2 to the outer side of the intermediate strip inner part 67 by means of the

waterproof adhesive seam 89. The double seam 77 is sealed on the inner side by means of a seam sealing band 91.

The adhesive seam 89 on the left in figure 2 prevents water which has penetrated in via the outer side of the intermediate strip part 65 from getting as far as the seams 37 and 79. The seam sealing band 91 on the left in figure 2 prevents water from getting through the double seam 77 as far as the inside of the jacket.

Instead of the adhesive seam 83 and/or the adhesive seam 89, a different kind of waterproof seam may also be provided, for example a sewn seam sealed by means of a seam sealing tape.

In the circle IIa drawn by dash-dotted lines in figure 2, two interacting fastening elements are indicated, a fastening element 93, arranged on the inner side of the covering strip 31, and a fastening element 95, arranged on the outer side of the intermediate strip 49. Consequently, the covering strip 31 can be fixed in a detachable way in a closed state on the intermediate strip 49 if the ventilating means is not to be effective. Alternatives for the fastening elements 93 and 95 are shown in figures 2a to 2c. In the embodiment in figure 2a, permanent magnet plates of opposed polarity are used as fastening elements, in the embodiment of figure 2b hook-and-loop fastening strips are used and in the embodiment according to figure 2c rows of press-studs are used.

The distances which in figure 2 can be seen for the sake of clarity between the covering strip 31 and the intermediate strip 49, on the one hand, and between the intermediate strip 49 and the zip fastener 13 and the ventilating strips 27, 29, on the other hand, do not occur in practice. In particular while riding on a motorcycle or skiing downhill, the covering strip 31 and the intermediate strip 49 are pressed by the relative wind right up against the zip fastener 13 and the ventilating strips 27 and 29, with the result that the possibility of wind and water penetrating as far as the zip fastener 13 and the ventilating strips 27, 29 is much less than could be presumed in the case of the representation of figure 2. On account of the folded-over channel 59, as already mentioned, the probability of water penetrating through to the ventilating strips 27, 29 is in any case extremely low.

Figure 3 shows the structure according to figure 2 along the sectional line III-III in figure 1 in the open state, in which both the covering strip 31 and the intermediate strip 49 have been opened so far that the ventilating strips 27 and 29 are freely accessible for ventilating air. In practice, the covering strip 31 and the intermediate strip 49 can be folded over even further, until they rest on the respectively neighboring region of the outer material 45, where they are

firmly held either by the relative wind or by further fastening or fixing elements (not represented).

Consequently, to make the ventilating means become effective, there is no need - as in the case of the previously considered jackets of the prior art - for the zip fastener 13 to be opened, but instead it is sufficient to bring the covering strip 31 and the intermediate strip 49 out of the position shown in figure 2 into the opened position shown in figure 3 or into a still further opened position. This is possible with a very simple movement of the hand, and even if the hand is in a thick glove.

Different embodiments, which differ with regard to the structural design concerning material layers of the jacket 11, are further considered on the basis of figures 5 to 7. These figures each only show that part of the structure with the covering strip 31 closed that corresponds to the right-hand part of figure 2.

Figure 5 shows what is known as a Z-liner construction, in which the jacket is made up of an outer material 45 and a functional layer 97, which is separate from said outer material 45 and loosely attached to it. In this case, the functional layer 97 is sewn to the outer material 45 only in peripheral regions, to be precise by means of a double seam 99. In the case of this construction, the covering strip outer part 61 has on the outer side an outer material, which preferably consists of the same material as the outer material 45 of the jacket, and on its inner side a functional layer 101, it being possible for the outer material 45 and the functional layer 101 of the covering strip outer part 61 to be combined to form a laminate. The covering strip inner part 63 is likewise made up with a functional layer. This functional layer is joined to the right-hand side of the ventilating strip 29 by means of the seam 39 and to the functional layer 101 of the covering strip outer part 61 by means of the adhesive seam 83. The double seam 99, by means of which the outer material 45 and the functional layer 101 of the covering strip outer part 61 are joined to the corresponding edge of the outer material 45 and of the functional layer 97 of the jacket, is sealed by means of a seam sealing tape 103. Water which has penetrated as far as the left-hand side of the adhesive seam 83 is prevented by the adhesive seam 83 from penetrating as far as the seam 39, and consequently as far as the inside of the jacket. Water which has penetrated the double seam 99 is prevented from getting as far as the seam 39, and consequently as far as the inside of the jacket, by the seam sealing band 103.

With regard to the structure of the covering strip outer part 61, several variations are possible. A waterproof outer material or an outer material combined with a functional layer may be used, it being possible for the

functional layer to be joined to the outer material loosely or in the form of a laminate.

The embodiment shown in figure 6 shows what is known as a laminate structure. In this case, the outer material and the functional layer of the jacket 11 are combined with each other to form a laminate 105, which may be a two-layer laminate with an outer material layer and a functional layer or a three-layer laminate with an outer material layer, a lining layer and a functional layer located in between. This leads to a particularly simple and lightweight structure of the jacket. In the embodiment in figure 6, the covering strip outer part 61 also comprises such a laminate with at least one outer material layer and a functional layer. Otherwise, the structure of this embodiment coincides with the structure according to figure 5.

With regard to the structure of the covering strip 31 of this embodiment, again several variations are possible. The covering strip outer part 61 and/or the covering strip inner part 63 may be made up of a two-layer laminate or a three-layer laminate, with the material layers already mentioned. In the case of one variation, the covering strip outer part 61 has a functional layer laminate and the covering strip inner part 63 has a textile layer without a functional layer. In the case of another variation, the covering strip inner part 63 has a functional layer laminate and the covering strip outer part 61 has a textile layer without a functional layer.

Figure 7 shows an embodiment of the LTD-liner construction already mentioned and shown in the right-hand region of figure 2, in which the outer material 45 and a functional lining 47, which is separate from the latter, with a functional layer and a lining layer, are used. Figure 7 shows this construction in an enlarged representation, but otherwise coincides with the LTD-liner construction shown on the right-hand side of figure 2, with the result that, in connection with figure 7, reference can be made to the description used there.

Figure 8 shows an already previously indicated embodiment of the ventilating means according to the invention, in which the covering strip 31 and the intermediate strip 49 are arranged on the inner side of the zip fastener 13, facing the body of the user of the jacket 11. Otherwise, the strips 31 and 49 have the same structure and may have the same variations as have already been explained in connection with the previous figures. Therefore, the reference numerals used in the previous figures are also used in figure 8.

Figures 9 and 10 show embodiments of the invention in which the ventilating means has in addition to the ventilating strips 27 and 29 a ventilation restricting means, by means of which it is possible in addition to the

two possibilities of no ventilation and maximum ventilation to choose a ventilating stage in between with restricted ventilation. In a restricting position, the ventilation restricting means is arranged parallel to the ventilating material, and covering at least a partial region of the ventilating material, and it reduces the amount of ventilating air reaching the inside of the jacket. In a release position, the ventilating restricting means exposes the ventilating material and does not effect any ventilation restriction.

A sectional view along the sectional line II-II in figure 1 of a first embodiment with ventilation restricting means is shown in figure 9. This ventilation restricting means is formed by a restricting strip 111 being arranged between the ventilating strips 27, 29 and the zip fastener 13, on the one hand, and the covering strip 31 and the intermediate strip 49, on the other hand, which restricting strip can be moved in relation to the ventilating strips 27 and 29 between a closed position, in which it covers at least part of the ventilating strips 27 and 29, and an open position, in which it exposes the ventilating strips 27, 29. The restricting strip 111 is made up of a ventilation restricting material which has an air permeability value which is lower than the air permeability value of the ventilating material. The air permeability value of the ventilation restricting material is at least approximately 30 $l/m^2/s$ and in practical embodiments lies in a range from approximately 20 $l/m^2/s$ to approximately 400 $l/m^2/s$. In a practical realization of the ventilating means according to the invention with a restricting strip 111, the restricting strip 111 is made up with a material obtainable under the name Cordura linen weave fabric with 300 dtex from the company Seafield and has an air permeability value of approximately 40 $l/m^2/s$.

The restricting strip 111 is joined on its left side in figure 9 to the left-hand edge of the ventilating strip 27 and to the intermediate strip inner part 67 by means of the seam 37. On its right-hand side in figure 9, the restricting strip 111 is provided with at least one fastening element 113, by means of which the restricting strip 111 can be kept in the closed position or restricting position and which may be, for example, a magnetic stud, a press-stud or a hook-and-loop fastener. The fastening element interacts with a complementary fastening element arranged on the inner side of the covering strip inner part 63. To allow the restricting strip 111 also to be fixed in its open position, a further complementary fastening device (not shown) may be provided in the region of the left-hand side of the restricting strip 111 in figure 9.

Figure 10 shows in a front view similar to figure 1 a jacket 115 with a two-part covering strip, with a covering strip part 117 which is on the upper

side in figure 10 and a covering strip part 119 which is on the lower side in figure 10, which are able to be fastened at various heights of the zip fastener 13 and each swiveled according to choice into an open position and a closed position. In the case of the representation in figure 10, the upper covering strip part 117 is in the open position and the lower covering strip part 119 is in the closed position. In this embodiment, the intermediate strip is also subdivided into an intermediate strip part 120 which is on the upper side in figure 10 and a lower intermediate strip part, which cannot be seen in figure 10 because it is concealed by the lower covering strip part 119. In the case of the position shown in figure 10, this leads to both ventilating strips 27, 29 being exposed only in the upper region of the jacket and a ventilating effect of the ventilating means being provided only in the upper region of the jacket 115. If the two covering strip parts 117, 119 are in the closed position, both ventilating strips 27, 29 are completely covered and the ventilating means is blocked. Each of the strip parts 117, 119, 120 and the intermediate strip part which cannot be seen is provided in the embodiment shown in figure 10 with a number of fastening elements 121, 123, by means of which these strip parts can be kept in the closed position and which may be, for example, magnetic studs, press-studs or hook-and-loop fasteners. Fastening elements by means of which these strip parts can be kept in the opened position may also be provided.

In each of its lower end regions, the two covering strip parts 117, 119 and the two intermediate strip parts are each provided with hook-and-loop fastening elements 125, 127, to allow them to be kept there in the closed position, only the hook-and-loop fastening elements of the two upper strip parts 117, 120 being visible because of the closed state of the two lower strip parts.

In the case of a modification (not represented) of the embodiment shown in figure 10, the covering strip and, if there is one, also the intermediate strip is subdivided not by transverse dividing but by longitudinal dividing into two strip parts, which can be brought into an open position or a closed position independently of each other.

It is also possible for the two variants shown in figures 9 and 10 to be combined with each other, that is a ventilation restricting means according to figure 9 and a multi-part covering strip and, if appropriate, a multi-part intermediate strip according to figure 10. In this case, further graduations of restricted ventilation are obtained.